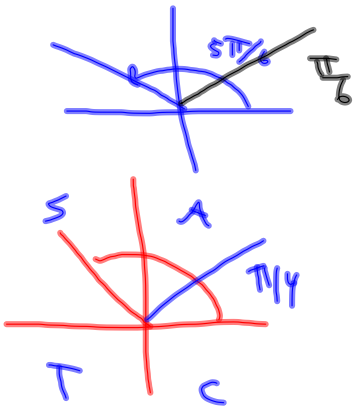
1. $\sin\frac{\pi}{6} = \frac{1}{2}$

2. $\cos\frac{\pi}{4} = \frac{\sqrt{2}}{2}$

3. $\tan\frac{\pi}{2} = *$

4. $\cos\frac{5\pi}{6} = -\frac{\sqrt{3}}{2}$

5. $\tan\frac{3\pi}{4} = -1$



Mar 19-11:15 AM

15. $x = 2\sin t \quad y = 3\cos t$

$\frac{dx}{dt} = 2\cos t \quad \frac{dy}{dt} = -3\sin t$

$$\int_0^{\pi/2} \sqrt{4\cos^2 t + 9\sin^2 t}\ dt$$

$\cos^2 t = 1 - \sin^2 t$

$$\int_0^{\pi/2} \sqrt{4 - 4\sin^2 t + 9\sin^2 t}$$

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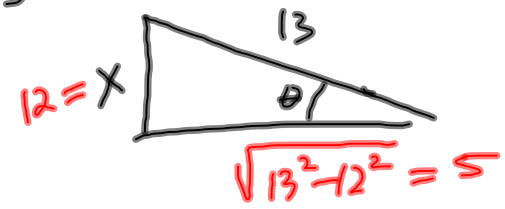
23.



$\frac{d\theta}{dt} = 2 \frac{rad}{min}$; $\frac{dx}{dt} = ?$ when $x = 12$

$\sin\theta = \frac{x}{13}$ $\quad \cos\theta = \frac{5}{13}$

$x = 13\sin\theta$

$\frac{dx}{dt} = 13\cos\theta \frac{d\theta}{dt}$

$= 13 \cdot \frac{5}{13} \cdot 2 = 10$

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25.

$\lim_{n\to\infty} \sum_{j=1}^{n} \frac{1}{\sqrt{x_j}} \Delta x = \int_w^v \frac{1}{\sqrt{x}} dx$ $\quad x^{-\frac{1}{2}}$

def. $\int_a^b f(x)\,dx = \lim_{\Delta x \to 0} \sum f(x_i)\Delta x$

$= 2x^{\frac{1}{2}} \Big|_w^v = 2\left(\sqrt{v} - \sqrt{w}\right)$

Mar 19-11:50 AM

Review 10 extrema

extrema- max, min

relative or absolute
(local) (global)

candidates - critical pts & end pts

$f'(x)=0$ $f'(x)=\not\exists$

1st der. test
sign graph & sentence

endpts - 0 + 0 -

-2 -1 2 5

or 2^{nd} der test

(+ +) min

(- -) max

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take note: open or closed interval

/ no endpts

✓ end pts

use proper vocabulary

is vs at

min at $x=2$ — where is the ~~max~~ min

max is $y=7$ what is the max

Mar 19-12:04 PM

find the absolute maximum for

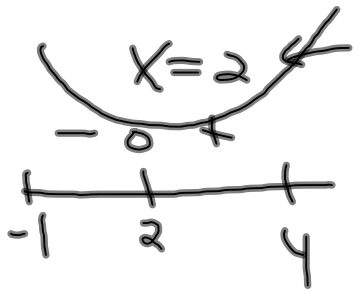
$y = \frac{1}{3}x^3 - 4x$ on $[-1, 4]$

$y' = x^2 - 4 = 0$

$x = \pm 2$

-2 not in domain

$x = 2$ ← min here



end pts

$f(-1) = \frac{1}{3}(-1)^3 + 4 = 3\frac{2}{3} = \frac{11}{3}$

$f(4) = \frac{1}{3} \cdot 4^3 - 4^2 = \frac{16}{3}$

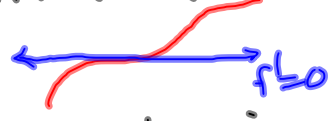
abs max

Mar 19-12:08 PM

p132 #5

monotonic – no peaks or valleys

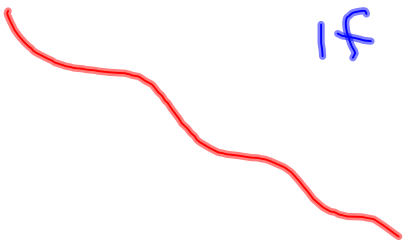
monotonic increasing – never decreases



if $b > a$, $f(b) \geq f(a)$

monotonic decreasing – never increases

if $b > a$, $f(b) \leq f(a)$



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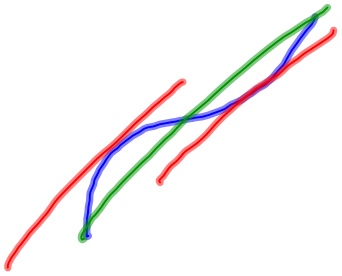
I ~~$f(8) > 9$~~ has to? no

$f(8) \geq f(7) = 6$



II ~~$f'(5) > 0$?~~

III only (C)

III $f'(c) = 3 = \dfrac{f(7) - f(3)}{7-3} = \dfrac{8+4}{4} = 3$ MVT

Yes

Mar 19-12:27 PM